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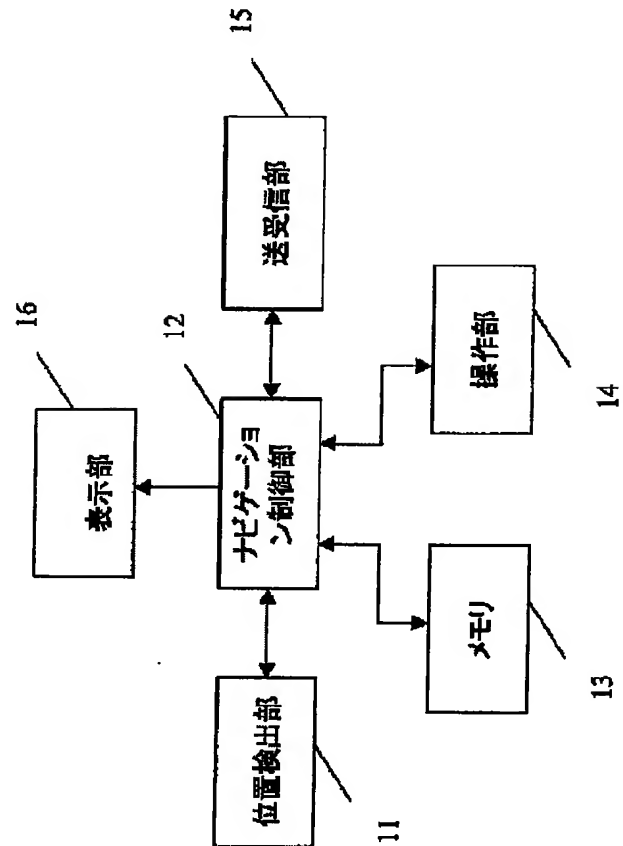PUBLICATION DATE   : 08-05-03

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TITLE   :   NAVIGATION SYSTEM

ABSTRACT :   PROBLEM TO BE SOLVED: To provide an excellent navigation system which enables people who come on foot or by train or bus and people who come by vehicle including taxies and private vehicles to merge into each other at the most preferable place.

SOLUTION: The navigation system obtains one's own positional information and others' positional information by using a positional information detection unit 11, calculates a plurality of candidates for merging position registered in advance in a memory 13 as merging positions for the people and vehicles based on the positional information by a navigation control unit 12, selects one merging position from the plurality of calculated merging positions as a new merging position. The new merging position is provided for the others by a transmission unit 15, thereby obtaining a merging position which is common to the one and others, and suitable for people and vehicles to be merged.

Notes:
1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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CLAIMS

[Claim(s)]

[Claim 1] A position information acquisition means to acquire the position information on a mobile, and a calculation means to compute a unification position candidate from the unification position set beforehand registered based on said acquired position information, The navigation system characterized by having the unification position determination means which chooses one from said unification position candidate computed with said calculation means, and is made into a unification position, and a transmitting means to transmit said unification position to said mobile.

[Claim 2] A position information acquisition means to acquire the position information on a self-mobile and other mobiles, and a calculation means to compute a unification position candidate from the unification position set beforehand registered based on said acquired position information, The navigation system characterized by having the unification position determination means which chooses one from said unification position candidate computed with said calculation means, and is made into a unification position, and a transmitting means to transmit said unification position to said other mobiles.

[Claim 3] Said transmitting means is a navigation system according to claim 1 or 2 further characterized by being what offers at least one of the map information to said unification position, the routing assistance information to said unification position, estimated time of arrival, and unification schedule time.

[Claim 4] Said unification position candidate is a navigation system according to claim 1 or 2 characterized by being a position suitable for the unification containing at least one of a station, a stop, a supermarket, a convenience store, a park, a public office, a public hall, a school, a shopping mall, a movie complex, a parking lot, an open space, and crossings.

[Claim 5] The navigation system according to claim 1 or 2 which the priority as a unification position is given to said unification position candidate, respectively, and is characterized by said unification position determination means being a means to choose one according to said priority.

[Claim 6] Said priority is a navigation system according to claim 5 characterized by what it opts for at least in consideration of the arrival anticipation time to the existence and said unification position candidate of a parking lot place.

[Claim 7] The navigation system according to claim 5 characterized by having a display means to display said unification position candidate with said priority, and an operation means to choose said unification position manually.

[Claim 8] In a navigation system according to claim 1 to 7 Navigation equipment equipped with at least one of said position information acquisition means to acquire the position information on a mobile, said calculation means to compute a unification position candidate, said unification position determination means that chooses one from said unification position candidate, and is made into a unification position, and said transmitting means to transmit said unification position.

[Claim 9] In a navigation system according to claim 1 to 7 Center equipment equipped with at least one of said position information acquisition means to acquire the position information on a mobile, said calculation means to compute a unification position candidate, said unification position determination means that chooses one from said unification position candidate, and is made into a unification position, and said transmitting means to transmit said unification position.

DETAILED DESCRIPTION

Detailed Description of the Invention]
0001]
Field of the Invention] This invention relates to the navigation system which can set up the unification position

of two or more mobiles easily.

[0002] .

[Description of the Prior Art] Since a car and a car enable it to join quickly conventionally, the navigation system constituted so that it might communicate, respectively and could join quickly with the navigation equipment carried in those cars is indicated to JP,2000-88591,A. This navigation system asks for the middle unification position which can join most quickly among two or more cars in consideration of the running speed of those cars, road traffic congestion information, etc., makes that middle unification position the new purpose position, and the car used as a master transmits that purpose position information to other vehicle.

[0003]

[Problem to be solved by the invention] However, it is completely unknown what kind of position is determined as a new purpose position in this kind of thing. For example, there was much traffic, and since it was set as the position which is not necessarily desirable as what is called unification positions in a place without the road or parking lot where it is difficult to stop, and the very large towns of a car etc., it was not desirable practically.

[0004] Moreover, in what was indicated in the previous gazette, it was what no is taken into consideration about unification with people and Kuruma for the purpose of unification of vehicles, and is hardly helpful to unification with people and Kuruma.

[0005] This invention solves such a conventional problem and aims at offering the navigation system excellent in unification of two or more mobiles.

[0006]

[Means for solving problem] A position information acquisition means by which the navigation system of this invention acquires the position information on a mobile, It has a calculation means to compute a unification position candidate from the unification position set beforehand registered based on the acquired position information, the unification position determination means which chooses one from the unification position candidate computed with the calculation means, and is made into a unification position, and a transmitting means to transmit a unification position to a mobile.

[0007] Since a unification position is chosen by this composition from two or more unification position candidates suitable for the unification registered beforehand, a unification position does not turn into an inconvenient position.

[0008] Moreover, a position information acquisition means by which this invention acquires the position information on a self-mobile and other mobiles, It has a calculation means to compute a unification position candidate from the unification position set beforehand registered based on the acquired position information, the unification position determination means which chooses one from two or more unification position candidates computed with the calculation means, and is made into a unification position, and a transmitting means to transmit a unification position to other mobiles.

[0009] Since two or more unification position candidates who were suitable for a self-mobile and other mobiles joining with this composition are computed and one is chosen from that inside, a unification position does not turn into an inconvenient position and it can join in the unification position where a self-mobile and other mobiles are suitable.

[0010] Moreover, as for this invention, a transmitting means offers at least one of the map information to a unification position, the routing assistance information to a unification position, estimated time of arrival, and unification schedule time further. this composition -- a mobile -- this -- it can arrive at the unification position chosen based on at least one of map information, routing assistance information, estimated time of arrival, or unification schedule time correctly.

[0011] Moreover, this invention is the position where two or more unification position candidates were suitable for the unification included at least one of a station, a stop, a supermarket, a convenience store, a park, a public office, a public hall, a school, a shopping mall, a movie complex, and parking lots. By this composition, it is not decided like before that it will be a position inconvenient to unification, and it is decided. [it] [a position desirable as a unification position]

[0012] Moreover, the priority as a unification position is given to a unification position candidate, respectively, and the unification position determination means constitutes this invention so that one may be chosen according to a priority. This composition can determine a more desirable unification position.

[0013] Moreover, this invention has determined the priority at least in consideration of the arrival anticipation time to the existence and the unification position candidate of a parking lot place. A unification position can be chosen by this composition, without being able to take into consideration the existence of a parking lot, and which arrive previously, being able to determine a priority, and troubling people and a car by waiting with combination mobile / joining], such as men, vehicles, and people and Kuruma.

[0014] Furthermore, this invention is equipped with a display means to display a unification position candidate

with a priority, and an operation means to choose a unification position manually. By this composition, it is not dependent on a machine, and an operator can check by the eye and a desirable position can be chosen.
[0015]
[Mode for carrying out the invention] The form of operation of this invention is hereafter explained using Drawings.
[0016] (Form of the 1st operation) Drawing 1 is the outline block diagram of the navigation system in the form of operation of the 1st of this invention.
[0017] In drawing 1 , the position primary detecting element 11 consists of a GPS receiving set, independence navigation positioning equipment, etc., and it is constituted so that a self current position may be detected and the navigation control part 12 may be supplied.
[0018] A memory 13 memorizes map information and a unification position set, and consists of a CD-ROM, a DVD-ROM, etc., for example, is the basis of control of the navigation control part 12. Information is suitably read from the memorized map information or a unification position set, and it is constituted so that the navigation control part 12 may be supplied.
[0019] Each of information which a final controlling element 14 inputs the information on the destination, the course ground, etc. and various other instructions, and was inputted here, and instructions is constituted so that the navigation control part 12 may be supplied.
[0020] Transmission-and-reception **** 15 is the basis of control of the navigation control part 12, and Operation information, including a train, Bath, etc., During the traffic congestion information on a road, and construction, information, various traffic pertinent information on other, the station registered beforehand, It is equipment which acquires confusion information, including a stop, a parking lot, etc., etc. by radio ****** with the center equipment which is not illustrated, and each information acquired here is constituted so that the navigation control part 12 may be supplied. Transmission-and-reception **** 15 is constituted so that radio ****** with other navigation equipment may also be possible through a direct or public radio circuit etc.
[0021] The navigation control part 12 reads the map information around a current position from a memory 13 based on the current position information detected with the position sensing device 11. When the destination, the course ground, etc. are inputted from a final controlling element 14, it sets up the course to the course ground and the destination automatically, and it not only displays a current position and the map of the circumference of it on the display part 16, but controls to display on the display part 16.
[0022] Furthermore, when the navigation control part 12 inputs the instructions beforehand defined from the final controlling element 14, Based on the instructions, confusion information, including information, various traffic pertinent information on other, the parking lot registered beforehand, etc., etc. is acquired during operation information, including a train, Bath, etc., the traffic congestion information on a road, and construction by radio ****** with the center equipment which is not controlling and illustrating transmission-and-reception **** 15.
[0023] By radio ****** with other navigation equipment, continuously The position information on other navigation equipment, That is, based on operation information, confusion information, etc. which acquired the others' position information and were acquired previously, and position information, two or more desirable unification position candidates of self and the others are computed, and a new unification position is determined by choosing one from the inside.
[0024] The determined unification position and the map information to the unification position, routing assistance information, unification time, attainment anticipation time, etc. are controlled to transmit to the others through transmission-and-reception **** 15.
[0025] Next, the operation is explained in detail about the navigation system in the form of this operation using drawing 2 and drawing 5 . A flow chart for drawing 2 to explain operation of the navigation system in the form of operation of the 1st of this invention here and drawing 5 are the explanatory views showing the concrete example for explaining the form of this operation more nearly plainly.
[0026] When unification with the others is wished, the key for specifying the others who wish is operated. Thus, if a key is operated, it is detected by the navigation control part 12 and the navigation control part 12 directs to start radio ****** with the others who specified previously to transmission-and-reception **** 15. And in radio ****** with the others, the navigation equipment which serves as navigation equipment used as a master and a slave first is determined.
[0027] Here, although what is necessary is just to determine by each telephone call and connection, you may constitute a master and the determination of a slave so that a master and others may be determined as a slave automatically [one / any]. For example, the navigation equipment of the direction for which it appealed, Or the navigation equipment carried in Kuruma, Or the navigation equipment of those who wished to join by the one where the throughput of the navigation control part 12 is higher serving as a master automatically, Or you may constitute so that the one where portable navigation equipment or the throughput of the navigation control part

12 is lower may be automatically determined as a slave.

[0028] Thus, in Step (it is hereafter described as S in a figure) 201 shown in drawing 2 , a master is determined first. the navigation equipment determined as the master here in order to give the following explanation intelligible -- self navigation equipment or navigation equipment which only called it self and was determined as the slave -- the others' navigation equipment -- or it is only called the others.

[0029] If a master is determined, in the following step 202, the navigation equipment of self determined as the master will require the current position information on the others' navigation equipment as transmitting to the navigation equipment of self from each navigation equipment of the others determined as the slave.

[0030] If each of the others' navigation equipment transmits the current position information on the others' navigation equipment according to a demand, in the following step 203, the navigation equipment of self will receive this and will supply the navigation control part 12.

[0031] The navigation control part 12 computes a temporary unification position first in the following step 204 based on each current position information on the navigation equipment of the others who received, and the current position information on self detected by the position primary detecting element 11 in the navigation equipment of self.

[0032] And in the following step 205, it carries out based on the temporary unification position computed at Step 204. From the unification position set beforehand registered into the memory 13, two or more unification position candidates, such as the station which exists around it, a stop, a supermarket, a convenience store, a park, a public office, a public hall, a school, a shopping mall, a movie complex, and an open space, are extracted.

[0033] A priority desirable as a unification position of people and Kuruma is assigned to the unification position candidate registered beforehand. And in the following step 206, the priority as a unification position is displayed on the display part 16, respectively with two or more unification position candidates extracted at Step 205.

[0034] If one is chosen from two or more unification position candidates extracted previously in the following step 207 based on the priority displayed on the display part 16 using a final controlling element 14, it will set to the following step 208. While the course to the selected unification position and its unification position is set up automatically, respectively and it is displayed on the display part 16, those information is transmitted to the others.

[0035] Therefore, the others can join the map information to a unification position that self was set up, and the routing assistance information to a unification position, in a unification position the optimal, if it goes to a unification position according to the transmitted map information to a unification position, and the transmitted routing assistance information to a unification position. And since unification positions are the person registered beforehand and a position chosen as Kuruma's unification from desirable unification position candidates, it can also lessen an inconvenient position not turning into a unification position when joining, and making trouble to people and a car very much.

[0036] In addition, when one was chosen from two or more unification position candidates, it was made to choose manually in Step 207 with the form of this operation using a final controlling element 14, but you may make it make one choose this automatically in the navigation control part 12 according to each priority.

[0037] Thus, when constituted, skip Step 206 and it sets to Step 207. Without displaying two or more unification position candidates on the display part 16, as one highest unification position of a priority is chosen and being previously explained in the following step 208, it is also possible to display the selected unification position and the routing assistance information to the unification position on the display part 16, respectively.

[0038] Here, the concrete example is explained in detail about the unification position candidate's of people and Kuruma's priority. The unification position candidate of people and Kuruma A station, a stop, a supermarket, a convenience store, a parking lot, Are positions registered beforehand, such as a public office, a public hall, a school, a park, a shopping mall, a movie complex, and an open space, and it is taken into consideration whether there is any place which can park Kuruma at these positions first. When there is a parking lot, on condition that Kuruma can arrive ahead of people, when there is no parking lot Since waiting for a long time is not desirable if it is a charge even if it determines the priority on condition that people can reach ahead of Kuruma, and there is a parking lot, the priority as a unification position is changed according to the parking fee. If a parking fee is high, it will be made to specifically lower the priority as a unification position. furthermore, when a priority is raised and those joining use a train, Bath, etc. so that it is close to the unification position where the position is temporary each unification position candidate's priority is determined as a priority is raised in consideration of the train, the charge of Bath, the man's on foot time, etc. so that there are little the charge and on foot time.

0039] In unification of vehicles, it is not important which arrives previously, and if the parking lot which will raise priority if a unification position candidate has a parking lot is no charge, a priority will be raised further.

0040] In drawing 5 , the case where Car A and Man B join is considered now.

0041] In this case, since there is Man B near C station of a train, or the stop in Bath, it is also examined that

Man B joins using a train or Bath. That is, since the timetable of a train or Bath, a fare table, etc. are required when Man B uses a train and Bath, they are acquired from center equipment by transmission-and-reception **** 15. And also about Car A, during the traffic congestion situation of a road, and construction, since information etc. is required, these are acquired from center equipment by transmission-and-reception **** 15. And it is computed based on the information about a train, Bath, and a road whether it is earliest that Car A and Man B join where, and a temporary thing unification position is determined.

[0042] That is, it supposes that it was now and present time at 13:00, a train, the timetable of Bath, the traffic congestion situation of a road, a construction situation, etc. are acquired from center equipment, and a temporary unification position is computed. For example, when Man B moves to B station by train, and when in the case of the route which Man B moves to A station by train both sides move in Road D top and a temporary unification position and unification time are computed, supposing it is as follows 1) A station alighting : Man B gets on from C station, and will arrive at A station by train at 13:30. It moves on foot on Road A. Road A is congested and Car A can join in a position (**) at Man B and 13:48.

2) B station alighting : Man B gets on from C station, and will arrive at B station by train at 13:20. It moves on foot on Road E. Car A goes into Road E from Road D, and since there is a mutual passing place by road repairing on Road E, it can join in a position (being) at Man B and 13:35.

3) (obtaining) -- position: -- about Road D, traffic congestion information is not acquired from center equipment, but those [B] who move Car A and on foot can join by (obtaining) at 13:20.

from the above result, I hear that joining in the position of (obtaining) can join early most, and the position of (obtaining) is computed as a temporary unification position in Step 204.

[0043] In addition, although explained by the case where a temporary unification position is computed here on the conditions which can join early most The same effect is acquired even if this invention computes tolls, such as time to unification, fares, such as a train, Bath, and a taxi, and a highway, etc. by carrying out a weighting with a priority, without being limited to this. Moreover, you may enable it to set up the movement speed of Man's B on foot individually also as people's average on foot speed.

[0044] And in the following step 205, a convenience store (a) and parking lot (d) are extracted as a computed unification position candidate around a temporary unification position who was registered beforehand.

[0045] If convenience store (a) and parking lot (**) is extracted, the characteristic conditions of each convenience store (a) and parking lot (**) and the arrival anticipation time to the position will be computed, respectively, and the priority of each position (convenience store (a) and parking lot (**)) will be given based on the result.

[0046] Here, characteristic conditions are the existence of a parking lot, the charge of a parking lot, an empty condition of a parking lot, etc., for example. In the case of Man B, as on foot time, when 30 minutes is set up as a limit, it is whether to exceed it or not, for example.

[0047] A priority is computed by the characteristic conditions in a unification position candidate by seasoning them with the arrival anticipation time to each unification position candidate, and is given to them.

[0048] [time] now supposing a convenience store (a), the characteristic conditions of parking lot (d), and arrival anticipation time are as follows Those with a (convenience store a):parking lot, arrival anticipation time:13:15 parking-lot [2] (d) of the arrival anticipation time:13:22 man B of the free vehicle A : 1) Those with a parking lot, a parking fee -- arrival anticipation time [of the 200 yen vehicle A per 30 minutes]: -- arrival anticipation time [of the 13:25 man B]: -- since both have a parking lot, can park Car A in a parking lot and can stand by at 13:10 In this case, Man B does not need to arrive earlier than Car A, therefore that priority is determined as arrival anticipation time based on the charge of a parking lot etc.

[0049] Namely, in this case although the direction of a convenience store (a) becomes long as Man's B on foot time The limit (it is variable by 30 minutes and setup) is not exceeded as people's on foot time, but I hear that no charge and unification time have an early parking fee, and in the convenience store (a), a priority becomes high from parking lot (**), and a convenience store (a) is chosen in Step 207.

[0050] When [for example,] a unification position candidate does not have a parking lot Since it is required to stop to the way side etc. and to separate from a unification position as promptly as possible in order for Car A to pick up Man B, a unification position candidate to whom it becomes conditions to whom that Man B arrives earlier than Car A, and Man B becomes later than Car A becomes the lowest than the unification position candidate of others [priority / the]. That is, since parking violation will be carried out when the direction of Car A arrives early, it is taken into consideration when such conditions also determine a priority.

[0051] When choosing one from two or more unification position candidates according to a priority, may constitute so that this may be chosen automatically, but beforehand With and these unification position candidates As the arrival anticipation time of the characteristic conditions in these unification position candidates, Kuruma, and a man etc. was shown previously, it may display on the display part 14, and you may

constitute so that one may be chosen manually.

[0052] Thus, selection of a convenience store (a) will transmit the map information to the selected convenience store (a) and a convenience store (a), and routing assistance information to the others at the following step 208.

[0053] Therefore, when each goes to the convenience store (a) which is a unification position by Kuruma and on foot according to this map information and routing assistance information, [Man B] about — 13:15 — arrival and Car A — about — it will arrive at 13:22 and Car A and Man B can join as a result at a convenience store (a) at 13:22.

[0054] Next, the case where Car A, Man B, and Man C join is assumed.

[0055] In this case, three persons' temporary unification position is computed in Step 204. Since Man B and Man C are usable in a train and Bath respectively, a train and the operation information on Bath, a train, and the freight information on Bath come to hand from center equipment through transmission-and-reception **** 15, respectively. And based on information and road traffic pertinent information on other, the temporary unification position of Car A, Man B, and Man C is computed during the information from center equipment, the traffic congestion information on the road which came to hand through transmission-and-reception **** 15, and construction.

[0056] Supposing the neighborhood of A station is now computed as a temporary unification position, in the following step 205, two or more unification position candidates around the unification position registered beforehand will be extracted. A station, a convenience store (b), parking lot (b), and parking lot (b) are around the computed temporary unification position, and these are first extracted as two or more unification position candidates.

[0057] the characteristic conditions (the existence of a parking lot place, the charge, a free Type, a charge, etc.) concerning a unification position candidate as previously explained to the extracted unification position candidate — in addition, each priority in consideration of the arrival anticipation time of the car A to these unification position candidates, Man B, and Man C is given. And with two or more unification position candidates, it is the following step 206, and it is displayed on the display part 16, and further, it is the following step 207 and, as for these priorities, one with a high priority in it is chosen.

[0058] For example, if I hear that Man B and Man C can arrive at A station early for a while and there are from Car A when a temporary unification position is [A station] the neighborhood very much, the position will be chosen for A station in Step 207 as what has the highest priority. And since the map information to this selected unification position and its unification position and routing assistance information are transmitted to the others in the following step 208, respectively, the unification position chosen based on these information — Man B, Man C, and Car A — when each goes, it can join easily in the selected unification position.

[0059] As explained above, according to the form of operation of the 1st of this invention, self position information, Based on the others' position information, compute a temporary unification position, and two or more unification position candidates of the circumference of it registered beforehand are extracted. One unification position which he is trying to choose one unification position based on the priority given to these unification position candidates, and is finally chosen is chosen from the unification position candidates registered beforehand, it does not become an unsuitable position but an always desirable unification position can be chosen as unification.

[0060] Moreover, when Kuruma is allowed to arrive previously when there is a parking lot also in consideration of unification of people and Kuruma and there is no parking lot, the unification position candidate has determined the priority and has the advantage of making neither parking violation, other persons nor Kuruma trouble so that people may arrive previously.

[0061] (Form of the 2nd operation) Next, the form of the 2nd operation is explained using drawing 3 .

[0062] Drawing 3 is a flow chart explaining operation of the navigation system in the form of operation of the 2nd of this invention.

[0063] In hardware, with the form of the 1st operation, the form of the 2nd operation is also substantially the same and is constituted as drawing 1 . Therefore, the detailed explanation is omitted and explains the operation here using drawing 3 .

[0064] [a different point from the form of the 1st operation] in the form of the 2nd operation In a final controlling element 14, if the course ground on the way to the destination or the destination is inputted, while the map information to that destination or the course ground and routing assistance information will be displayed on the display part 16, respectively, I hear that the shortest unification position is computed also in consideration of his destination or the course ground, and there is.

[0065] In drawing 3 , Step 301-303 is the same as Step 201-203 of drawing 2 , is the step 303 so far, and obtains the others' current position information from the others who want to join.

[0066] And in the following step 304, it is judged in the navigation control part 12 whether the destination (the

course ground is included hereafter) is inputted. When the destination is not inputted, it shifts to Step 306 and the shortest unification position is computed based on self position information and the others' position information like the form of the 1st operation here.

[0067] When the destination is inputted in Step 304, it shifts to Step 305 and the shortest unification position is computed based on the destination, and self position information and the others' position information here.

[0068] When the shortest unification position is computed in Step 305 and 306, [the following step 307] Two or more unification position candidates who exist on the outskirts of a unification position of the shortest and who were registered beforehand are extracted, and set to subsequent Step 308–310. Like the form of the 1st operation, two or more unification position candidates are displayed on the display part 16 with each priority, and one is transmitted to the selected unification position by the others with the map information to the unification position, and routing assistance information manual operation or by choosing automatically from the inside.

[0069] Therefore, also when according to the form of the 2nd operation the shortest unification position is computed also in consideration of the destination when the destination is inputted, and it joins toward the destination, the optimal unification position can always be chosen.

[0070] Next, the case where the destination is inputted is explained in detail using drawing 5 .

[0071] The case where Man B joins Car A and drives to the destination now is assumed.

[0072] [with the form of the 1st operation, since it only said that Car A and Man B wanted to join early simply, the position of (obtaining) was computed as the shortest unification position based on both position information, but] In the form of the 2nd operation, since it will be detected in Step 304 and will shift to Step 305 if the destination is inputted, a temporary unification position is computed in consideration of the destination here.

[0073] That is, in the case of this example, if the destination is inputted in the navigation equipment of Car A, C crossing will be reached via C station from Road A toward the destination, and the routing assistance information which turns left at C crossing, goes into Road C, and goes to the destination will be generated. Therefore, in consideration of this routing assistance information, the temporary unification position of Car A and Man B will be set up, and if I hear that it can arrive at the destination early and it is for example, rather than joining at C station even if it takes time somewhat, near A station will be computed as a temporary unification position.

[0074] Also when Man B and Man C join Car A and go to the destination, in consideration of the routing assistance information on Car A, near A station is computed as a temporary unification position in the same procedure.

[0075] And if two or more unification position candidates around a temporary unification position are extracted, it is displayed on the display part 16 like the form of the 1st operation in Step 307–310 and one is chosen after that The selected unification position and the map information to the unification position, and routing assistance information are transmitted to the others, and it can join easily in the selected unification position by going to the unification position where self and the others were chosen according to the map information routing assistance information.

[0076] (Form of the 3rd operation) Next, the form of the 3rd operation is explained using drawing 4 .

[0077] Drawing 4 is a flow chart explaining operation of the navigation system in the form of operation of the 3rd of this invention.

[0078] The form of the 3rd operation is substantially constituted similarly with the form of the 1st operation in hardware as drawing 1 . Moreover, the form of the 3rd operation operates like [Step 207 and 309] the form of the 1st and the 2nd operation also in operation. Therefore, the detailed explanation is omitted and explains the operation here using drawing 4 .

[0079] In the form of the 3rd operation, the 1st and a different point from the form of the 2nd operation are having added Step 401–405 further the 1st, Step 207 in the form of the 2nd operation, and after 309.

[0080] That is, in Step 207 and 309, after one is chosen from two or more unification position candidates, the map information to one unification position chosen at the following step 401 and its unification position and routing assistance information are transmitted to the others, respectively.

[0081] Since it transmits that it locates [which the others wish / unification] in the following step 402 when a transmitting unification position is not unification locating [which he wishes in the others], it receives that it locates [which the transmitted others wish / unification] here.

[0082] And in the following step 403, it judges whether a unification position needs to be changed and the result is inputted by a final controlling element 14. When a unification position needs to be changed, it shifts to Step 404, a unification position is changed here, and the changed unification position and its changed map information to a unification position, and routing assistance information are transmitted to all the others.

[0083] In Step 403, when it is judged that self does not need change of a unification position, it shifts to Step 405 and the information on the purport that a unification position is not changed is transmitted only to the others who wish to change.

[0084] A concrete example is hereafter explained using drawing 5 .

[0085] In drawing 5 , the case where Man B and Man C join Car A, and go to the destination is assumed. In this case, as explained previously, at Step 309, A station is chosen as a unification position and this is transmitted to Man B and Man C in Step 401.

[0086] Although it is satisfactory in any way for Man B in the unification position chosen and determined previously, for Man C Wish to change as the advance course of Car A is gone into Road B not from C crossing course but from A station and it goes into C road via A crossing and B crossing. Or even if it remains as it is, it may wish for the advance course of Car A as he wants to join near the B crossing toward B crossing using Bath from A crossing.

[0087] In Step 402, in such a case, [Man C] If it is the case where it unification locating [to wish], for example, the advance course of Car A, goes into Road B from A station, and it goes into C road via A crossing and B crossing If it is the case where Man's C nearby bus stop and Man C want to join near the B crossing toward B crossing using Bath from A crossing, B crossing or the convenience store near it (f), a convenience store (g), or parking lot (e) will be specified, and it will be transmitted to a master.

[0088] Man C transmits, and a master receives information and judges whether a unification position needs to be changed of the following step 403. And when it is judged that a unification position needs to be changed, a unification position is changed at Step 404 and, of course, the change position and the map information to the change position, and routing assistance information are transmitted to the person C who wished change of the unification position at the other men B.

[0089] In Step 403, when it is judged that a unification position does not need to be changed, that is transmitted to the person C who wished to join at Step 405.

[0090] As mentioned above, according to the form of the 3rd operation, in a master, automatic or the unification position chosen manually in a slave in being inconvenient By transmitting to a master that it locates [which he wishes in a slave / unification], by selection of a master, a unification position with the slave which wishes change of a unification position can be changed arbitrarily, all the slaves can be told about the change, and master and unification of a slave can be performed more efficiently.

[0091] in addition, [any / 1st, 2nd, and 3rd / form of operation] in setting up a unification position Perform operation defined beforehand using a final controlling element 14, and it constitutes so that a series of operation may be made to perform. Therefore, [even when setting up a unification position like the same partner after that again, must operate a final controlling element 14 similarly one by one, and must make a series of operation perform, but] if the operation is made to perform once For example until it joins after that Every definite periods of time, such as 5 minutes, 10 minutes, and 15 etc. minutes, Or carrying out 10 minutes of the time [1st], carrying out 5 minutes of the time [2nd], and shortening the 3rd time interval one by one like 2 minutes, you may constitute so that it may return to Step 202 and 302 automatically and the same operation may be repeated.

[0092] Check each position of self and the others again anew, and a unification position according to the situation as a unification position is approached mutually, when constituted Thus, automatic, Or it can change manually, a certainly suitable earlier unification position can be set up, and it can join now in the unification position.

[0093] Moreover, although information, road traffic pertinent information on other, the empty information on a parking lot, etc. are raised with the form of the 1st, the 2nd, and the 3rd operation as information which comes to hand from center equipment during timetables, such as a train and Bath, a fare table, other operation information, the traffic congestion information on a road, and construction It is needless to say that all the information required for unification of people and Kuruma that changes every moment manages those information, or you may make it obtain it from the center equipment which holds those information.

[0094] and [the form of the 1st, the 2nd, and the 3rd operation] The unification position chosen from a master and the determination (Step 201, 301) of a slave, and the map information to the unification position, transmission (Step 208, 310) to the others of routing assistance information — further When the selected unification position is changed [constitute so that all (Step 405) even of transmission (Step 404) to the others of the changed unification position and the map information to the unification position, and routing assistance information and transmission to that effect / at the time of not being changed / may be performed in the navigation equipment used as a master, but] It is needless to say that you may make it make a part or all of these steps share with center equipment and the navigation equipment used as a slave.

[0095] In short, this invention is not limited to the navigation system constituted only from navigation equipment of what is called a stand-alone which carries and uses for Kuruma, or uses having by hand, but includes a system including center equipment and navigation equipment.

[0096] Specifically, for example [what is called the navigation equipment of the object for mount, or a portable stand-alone] To set [to only carry out, because the memory of small capacity is built in, and] up a unification

position [specify the partner who wants to join and / partner / the / self position information] only by transmitting to center equipment After center equipment performs said a series of operation of all and determines a unification position, you may constitute so that the routing assistance information to the determined unification position and its unification position may be transmitted to all the navigation equipment which wants to join.

[0097] [center equipment / in this case, the navigation equipment which wished a setup of the unification position in advance of the determination of a unification position] Conditions peculiar to two or more unification position candidates and those unification position candidates, arrival anticipation time, etc. are transmitted. When it points so that one may be chosen as the navigation equipment which wished a setup of the unification position from these unification position candidates, and the navigation equipment which wished a setup of the unification position chooses one and transmits to center equipment You may constitute so that center equipment may transmit the routing assistance information to the unification position and its unification position as the result to other navigation equipment.

[0098] And again, to center equipment, it supposes that it is to only make the conditions of two or more unification position candidates and those unification position candidates, arrival anticipation time, etc. compute, and may be made to perform others all with the navigation equipment used as a master.

[0099] the step 208 from the step [in / as explained previously in short / the form of the 1st, the 2nd, and the 3rd operation] 201, and the step 310 from Step 301 — further It is possible to also make a part or all of Step 404 and a series of steps to 405 share with center equipment or the navigation equipment used as a slave, respectively.

[0100] Thus, if constituted, even if it will be the navigation system which consists of navigation equipment which has only a memory with small capacity which is called what is called communication Nabih Map information, routing assistance information, etc. come to hand from center equipment, respectively, and it has the advantage said [that it can enough respond and].

[0101]
[Effect of the Invention] As explained above, [the navigation system of this invention] A position information acquisition means to acquire the position information on a mobile, and a calculation means to compute a unification position candidate from the unification position set beforehand registered based on the acquired position information, The unification position determination means which chooses one from the unification position candidate computed with the calculation means, and is made into a unification position, It has a transmitting means to transmit a unification position to a mobile, and since one is chosen from two or more unification position candidates registered beforehand when determining a unification position, it has the advantage that a position inconvenient as a unification position is not chosen.

[Translation done.]